

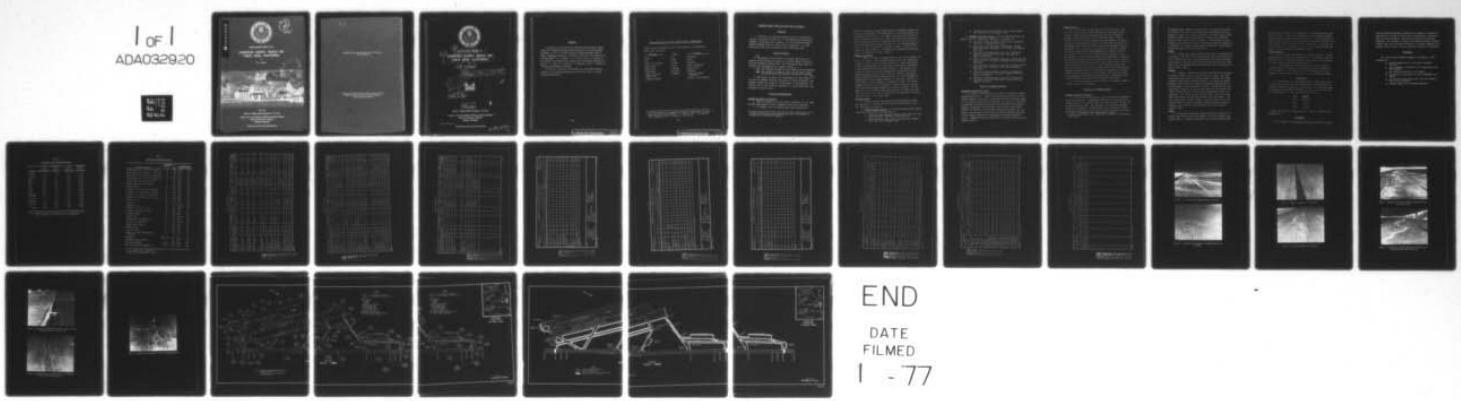
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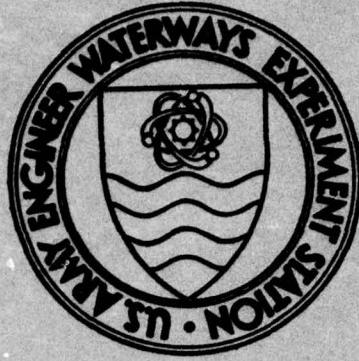


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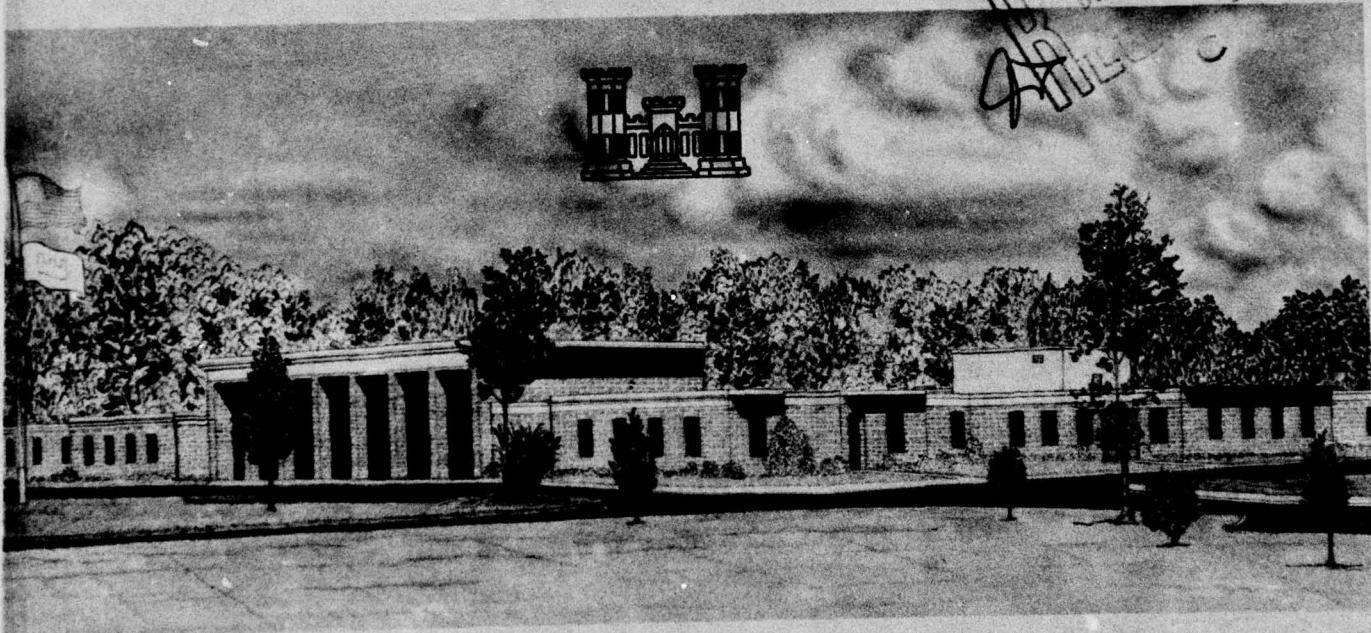
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## CONDITION SURVEY, MARCH AIR FORCE BASE, CALIFORNIA

by

R. D. Jackson

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June 1973

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Conducted by U. S. Army Engineer Waterways Experiment Station  
Soils and Pavements Laboratory  
Vicksburg, Mississippi

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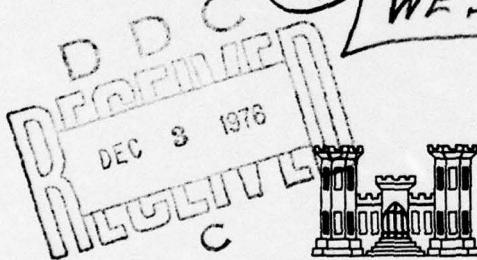
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## CONDITION SURVEY, MARCH AIR FORCE BASE, CALIFORNIA.

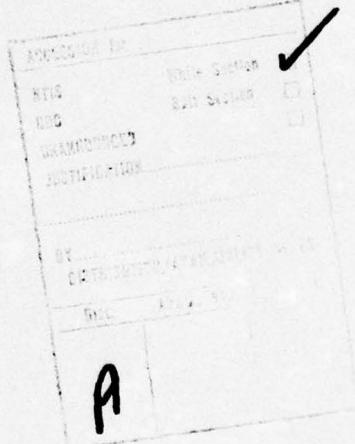
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10 R. D. Jackson

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Foreword

The study reported herein was conducted under the general supervision of the Engineering Design Criteria Branch, Soils and Pavements Laboratory, of the U. S. Army Engineer Waterways Experiment Station (WES), Vicksburg, Mississippi. Personnel involved in the condition survey were Messrs. R. D. Jackson, K. A. O'Connor, and S. R. Rowland, Jr. This report was prepared by Mr. Jackson under the general supervision of Messrs. J. P. Sale, R. G. Ahlvin, R. L. Hutchinson, and P. J. Vedros of the Soils and Pavements Laboratory.

COL Ernest D. Peixotto, CE, was Director of the WES during the conduct of the study and preparation of the report. Mr. F. R. Brown was Technical Director.

Conversion Factors, British to Metric Units of Measurement

British units of measurement used in this report can be converted to metric units as follows:

<u>Multiply</u>	<u>By</u>	<u>To Obtain</u>
inches	2.54	centimeters
feet	0.3048	meters
miles (U. S. statute)	1.609344	kilometers
square inches	6.4516	square centimeters
square yards	0.8361274	square meters
pounds (mass)	0.45359237	kilograms
pounds (force) per square inch	0.6894757	newtons per square centimeter
Fahrenheit degrees	*	Celsius or Kelvin degrees

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\* To obtain Celsius (C) temperature readings from Fahrenheit (F) readings, use the following formula:  $C = (5/9)(F - 32)$ . To obtain Kelvin (K) readings, use:  $K = (5/9)(F - 32) + 273.15$ .

CONDITION SURVEY, MARCH AIR FORCE BASE, CALIFORNIA

Authority

1. Authority for conducting condition surveys at selected airfields is contained in amendment to FY 1972 RDTE Funding Authorization (MFS-MC-5, 16 February 1972), subject: "Air Force Airfield Pavement Research Program," from the Office, Chief of Engineers, U. S. Army, Directorate of Military Construction, dated 18 February 1972.

Purpose and Scope

2. The purpose of this report is to present the results of a condition survey performed at March Air Force Base (MAFB), California, during 30 November-6 December 1972. The following two major areas of interest were considered in this condition survey:

- (1) The structural condition of the primary airfield pavements.  
(2) The condition of pavement repairs and the types of maintenance materials that have been used at this airfield.

3. This report is limited to a presentation of visual observations of the pavement conditions, discussion of these observations, and pertinent remarks with regard to the performance of the pavements. No physical tests of the pavements, foundations, or patching materials were performed during this survey.

Pertinent Background Data

General description of airfield

4. MAFB is located in Riverside County, California, on U. S. Highway 395, approximately 8 miles\* southeast of the city of Riverside.  
5. In November 1972, the airfield facilities consisted of a

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\* A table of factors for converting British units of measurement to metric units is presented on page vii.

NW-SE (13-31) runway, a large parking apron with extensions, maintenance and hangar access aprons, four warm-up aprons, connecting taxiways, and a heavy-duty alert facility. The runway was 13,300 ft long and 300 ft wide; the parking apron was about 1,900 ft wide and 8,500 ft long; and the heavy-duty alert facility included an apron that was 250 by 2,050 ft and two taxiways that were each 75 by 800 ft. The connecting taxiways were 75 and 150 ft wide and were of various lengths. A layout of the airfield is shown in plate 1. A pavement plan indicating the type pavement on each facility is shown in plate 2.

#### Climate and drainage

6. MAFB is located in a semiarid region, with hot, dry summers and cool, rainy winters. Record monthly average low and high temperatures occurred in January and July and are 38 and 92 F. The record extreme low and high temperatures are 21 and 118 F, respectively. Temperature and precipitation data are presented in table 1. The amounts of departure from normal for the 1971 temperatures and precipitation were determined using periods of record of 90 and 91 years, respectively. Annual precipitation averages approximately 11 in. The topography surrounding MAFB is rather rugged; however, the airfield is located on a rather flat area and consequently is difficult to drain. The surface drainage of the airfield is collected in a system of ditches and catch basins and then discharged through storm sewers and ditches. The sub-grade soils at the airfield range from sandy silts to sandy clays with some silty sands. The area is semiarid, and the water table is located some 160 to 190 ft below ground level.

#### Previous reports

7. Previous reports concerning the airfield pavements at MAFB are listed below. Pertinent data were extracted from them for use in this condition survey report.

8. Condition survey reports. The following reports were prepared by the Ohio River Division Laboratories, CE:

- a. "Report of Rigid Pavement Condition Survey, March Air Force Base, California," May 1956, Cincinnati, Ohio.
- b. "Condition Survey Report, March Air Force Base, California," June 1959, Cincinnati, Ohio.

- c. "Condition Survey Report, March Air Force Base, California," November 1962, Cincinnati, Ohio.
9. Pavement evaluation reports. The following reports were prepared by the U. S. Army Engineer District, Los Angeles, CE:
- a. "Airfield Pavement Evaluation, March Field, California," June 1944, Los Angeles, California.
  - b. "Airfield Pavement Evaluation, Addendum No. 1, March Field, Riverside, California," October 1947, Los Angeles, California.
  - c. "Airfield Pavement Evaluation Report No. 2, March Air Force Base, Riverside, California," June 1956, Los Angeles, California.
  - d. "Airfield Pavement Evaluation Report No. 3, March Air Force Base, Riverside, California," September 1958, Los Angeles, California.
  - e. "Airfield Pavement Evaluation Report No. 4, March Air Force Base, Riverside, California," July 1959, Los Angeles, California.
  - f. "Airfield Pavement Evaluation Report No. 5, March Air Force Base, Riverside, California," December 1960, Los Angeles, California.
  - g. "Airfield Pavement Evaluation Report No. 6, March Air Force Base, Riverside, California," November 1963, Los Angeles, California.

#### History of Airfield Pavements

##### Design and construction history

10. Pavements constructed prior to 1951 were designed to support medium-weight aircraft. Pavements constructed during 1951-57 were designed to support a 100,000-lb, single-gear load with twin wheels spaced 37 in. center to center and a tire contact area of 267 sq in. per wheel. The pavements constructed during 1958, 1959, and 1963 were designed to support a single-gear load of 265,000 lb on twin-twin wheels spaced 37-62-37 in., with each wheel having a contact area of 267 sq in. Details of the construction history of the airfield pavements (extracted from the reports referenced in paragraphs 8 and 9) are presented in table 2. Pavement thicknesses, descriptions, and other details are presented in table 3.

#### Traffic history

11. Prior to 1951, the airfield was used by B-25, B-26, B-29, B-50, and other smaller aircraft. During the period 1952-62, B-47's were the heaviest aircraft operating at the airfield, although an occasional B-52 used the airfield in a transient status. Traffic records for the period 1957-62 indicate that approximately 390 cycles\* per month of B-47 traffic, 160 cycles of KC-97 traffic, 100 cycles of heavy-cargo traffic, and 490 cycles of light-cargo and fighter traffic were applied. It is reasonable to assume that the amounts of traffic for the 5-yr period 1952-57 were approximately the same as those for the period of 1957-62. Traffic records were not available for the period 1963-64. Records indicate that the following amounts of traffic were applied at MAFB from January 1965-December 1972: B-52's, 8,200 cycles; KC-135's, 15,570 cycles; KC-97's, 5,235 cycles; C-135's, C-141's, and C-123's, 2,343 cycles; C-124's, 5,292 cycles; and all other aircraft, 53,654 cycles. In addition to this traffic, alert exercises were conducted during this period by B-52 and KC-135 aircraft that involved taxiing from the alert facility to the runway, taxiing down the length of the runway, and returning to the alert facility. Approximately 150 of these movements were made by both B-52 and KC-135 aircraft.

12. More than 95 percent of the takeoffs and landings at MAFB are from the south end of the runway.

#### Conditions of Pavement Surfaces

##### Pavement inspection procedure

13. The following procedure was used in conducting the inspection of the rigid pavements. Representative features were selected for detailed inspection. The features were then inspected slab\*\* by slab, and the defects were recorded. The locations of the individual pavement features, the inspection starting points, and the directions in which

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\* A cycle of operation is one takeoff and one landing.

\*\* A slab is the smallest unit, containing no joints, of a given pavement feature.

the pavements were inspected (shown by arrows) are indicated in plate 1. The results of the rigid pavement survey for those features that were inspected in detail are presented in table 4. This table shows a quantitative breakdown of the various types of defects and a condition rating for each feature inspected in detail. The procedures used for determining the condition rating of a pavement are given in Appendix III of Department of the Army Technical Manual TM 5-827-3, "Rigid Airfield Pavement Evaluation," dated September 1965.

#### Runway

14. The portland cement concrete (PCC) portions of the NW-SE runway (features R1A, R2B, R3C, R4C, R6B, and R7A) were in excellent structural condition, with only a small percentage of the slabs containing major defects. Only four major defects were noted in the entire runway. Feature R5D, the asphaltic concrete (AC) portion, was in very good condition (photos 1 and 2).

#### Taxiways

15. Taxiway 1 (features T1A, T2A, T3A, and T4A) was in excellent structural condition, since no major defects were noted. Only seven minor defects were found in the entire taxiway. Features T5A and T6A (taxiway 5) were also in excellent condition. The outer ramp taxiway (features T7A and T8A) was in excellent structural condition based on the percentage of slabs containing no defects. Feature T9A (the outer ramp taxiway extension) was in very good condition. This feature contained 18 major defects, of which 17 were longitudinal cracks in one paving lane. The taxi stripe runs down the edge of this lane, a fact which would seem to indicate that the cracks were load related. Taxiway 5 (features T5A and T6A) contained no major defects and only one minor defect and therefore was rated as being in excellent condition. Taxiways 3 and 4 (features T15C and T16C) were in fair condition (photos 3 and 4).

#### Aprons

16. The apron areas were in either very good or excellent condition. Major defects were widely spaced, and the minor defects were usually spalls. Considerable shoving of the shoulder pavements along

the south and east sides of the south end of the parking apron was noted (photos 5 and 6). Photo 7 shows the upheaval of the shoulder pavement along the east side of the south end of this apron. The shoving and upheaval occurred during 1972 and were apparently caused by expansion of the PCC pavement. Typical cracking of the AC pavement in the refueling area of the apron is shown in photo 8. Photo 9 shows the typically poor condition of the AC pavement on the transient apron.

#### Alert facilities

17. The SAC alert taxiways were in excellent condition. The SAC alert apron was in very good condition; however, if the major defects in the two 12.5- by 12.5-ft lanes along the eastern edge were disregarded, the apron could be rated in excellent condition.

18. The secondary (12-30) runway has been closed to aircraft traffic, except for a portion of the south end which is utilized as a part of taxiway 2. Those features not specifically mentioned in the preceding paragraphs were in either very good or excellent condition.

#### Maintenance

19. Maintenance of the airfield pavements at MAFB has generally consisted of repairing spalls and sealing joints of PCC pavements and coal-tar sealing of AC pavements. The majority of the spalls have been repaired with epoxy and PCC, although some repairs have been made with AC. Maintenance costs since 1964 have been as follows:

<u>Year</u>	<u>Amount</u>
1965	\$172,900
1969	61,500
1970	40,100

A joint sealing project is being planned for 1973 for a portion of the parking apron.

#### Evaluation

20. A summary of the pavement evaluation is presented in table 5.

Previously published pavement evaluations were updated to eliminate aircraft that are no longer in the Air Force inventory and to include aircraft that have been added to the inventory since the last pavement evaluation. The evaluation is based on the pavement thickness, flexural strength (PCC), base and subbase thickness and strength, strength of the subgrade (CBR or K value), and the structural condition of the pavement.

#### Conclusions

21. The following statements summarize the findings of this investigation:

- a. The PCC pavements were in very good to excellent condition.
- b. The AC pavement on the NW-SE (13-31) runway was in very good condition.
- c. The transient apron was in poor condition.
- d. The majority of the defects in the PCC pavements were spalls.
- e. In some areas of the aprons, the joint seal materials were in poor condition.
- f. Pavement repairs were performing adequately.

Table 1  
Temperature and Precipitation Data

<u>Month</u>	<u>1971 Average Temperature, F</u>	<u>Departure from Normal, F</u>	<u>1971 Precipi- tation, in.</u>	<u>Departure from Normal, in.</u>
January	53.3	2.0	0.66	-1.31
February	53.8	0.7	0.40	-1.89
March	57.9	1.6	0.08	-1.67
April	59.4	-1.1	0.24	-0.73
May	62.9	-1.9	0.27	0.05
June	70.5	0.9	0.00	-0.04
July	78.1	2.2	0.00	-0.06
August	80.4	4.9	0.00	-0.16
September	74.8	1.5	0.00	-0.09
October	63.6	-2.1	0.61	0.08
November	55.8	-2.3	0.16	-0.67
December	48.5	-4.8	3.45	1.32
Annual	63.3	1.6	5.87	-5.17

Note: Highest temperature in 1971 was 113 F on September 13;  
lowest temperature in 1971 was 28 F on December 14.

Table 2  
Airfield Construction History

Pavement Facility	Pavement Thickness in.	Type	Construction Year(s)	Agency
NW-SE runway, sta 11+11.93 to 21+11.93	13	PCC	1963	CE*
NW-SE runway, sta 21+11.93 to 134+11.93	13	PCC	1963	CE
NW-SE runway, sta 134+11.93 to 139+11.93	13	PCC	1963	CE
NW-SE runway, sta 139+11.93 to 144+11.93	14	PCC	1963	CE
NW-SE runway, AC adjacent to PCC	5	AC	1963	CE
NW-SE runway, AC outer portion	3	AC	1963	CE
Warm-up apron 1	17	PCC	1955	CE
Taxiway 1, sta 1+50.74 to 40+06.24	25	PCC	1963	CE
Taxiway 1, sta 40+06.24 to 50+06.24	24	PCC	1959	CE
Taxiway 1, sta 50+06.24 to 61+56.24	25	PCC	1963	CE
Taxiway 1, sta 61+56.24 to 72+85.11	23	PCC	1963	CE
Warm-up apron 3	17	PCC	1955	CE
Taxiway 2	19	PCC	1955	CE
Taxiways 3 and 4	3	AC	1938-39	QC**
Taxiway 5, sta 5+44 to 9+25	25	PCC	1963	CE
Taxiway 5, sta 9+25 to 16+00	23	PCC	1963	CE
NW warm-up apron	11	PCC	1951	CE
Parking apron	11	PCC	1944-51	CE
Parking apron strengthening	11	PCC	1956	CE
Parking apron extensions	17	PCC	1953-55	CE
Hangar access taxiway	15	PCC	1954	CE
Hangar aprons	15	PCC	1954	CE
Transient apron	4	AC	1951	CE
SE apron and outer ramp taxiway extensions	17	PCC	1955	CE
Taxiway 1A	18-11-18	PCC	1945	CE
Secondary runway (12-30)	4	AC	1945	CE
Outer ramp taxiway	13-16	PCC	1958	CE
SAC alert apron and taxiways	8-21	PCC	1959	CE

\* CE denotes Corps of Engineers.

\*\* QC denotes Quartermaster Corps.

Table 3  
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY NUMBER AND IDENTIFICATION	FACILITY	OVERLAY PAVEMENT				PAVEMENT				BASE				SUBGRADE		GENERAL CONDITION OF AREA CONSIDERED
		LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	FLEX. STR. PSI	THICK. IN.	DESCRIPTION	FLEX. STR. PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION	CBR OR K		
H2A	ME-SE runway; 1st 500 ft, 13 end, sta 11+41.93 to 16+11.93	500	Varies	13	Portland cement concrete	700	4	Asphaltic concrete	kei-50	7	Dry bound macadam	80	Subsoil (M)	4	Excellent	
H2B	ME-SE runway; 2nd 500 ft, 13 end, sta 16+11.93 to 21+11.93	500	Varies	13	Portland cement concrete	700	4	Asphaltic concrete	kei-50	6	Gravelly sand Disintegrated granite	65	Subsoil (M)	4		
R3C	ME-SE runway interior, sta 11+41.93 and intersection of taxiway 2 and runway	9,100	75	13	Portland cement concrete	700	4	Asphaltic concrete	kei-50	7	Dry bound macadam	80	Subsoil (M)	4	Excellent	
R4C	ME-SE runway interior, sta 11+41.93 to 13+11.93	2,200	Varies	13	Portland cement concrete	700	4	Asphaltic concrete	kei-50	7	Dry bound macadam	80	Subsoil (M)	4		
H5D	ME-SE runway interior; AC portion adjacent to, west side and east side	11,600	Varies	3-5	Asphaltic concrete Stab. aggregate BC	10	4	Asphaltic concrete	kei-50	9	Gravelly sand Disintegrated granite	65	Subsoil (CL-SM-MG)	8		
H5D	ME-SE runway interior, AC edges; west edge and east edge	13,300	50	-	-	-	3	Asphaltic concrete	kei-50	7	Dry bound macadam	80	Subsoil (CL-SM-MG)	8		
H6S	ME-SE runway, 31 end; end 500 ft, sta 13+41.93 to 13+11.93	500	200	13	Portland cement concrete $h_E = 24.7$	700	17	Portland cement	kei-50	9	Gravelly sand Disintegrated granite	65	Subsoil (CL-SM-MG)	8		
R7A	ME-SE runway, 31 end; 1st 500 ft, sta 13+41.93 to 14+11.93 (abandoned)	500	Varies	14	Portland cement concrete $h_E = 25.5$	700	17	Portland cement concrete	kei-50	6	Subgrade (CL-SM)	100	Subgrade (CL-SM)	100	Excellent	
R8C	Secondary runway 12-30	6,980	150	-	-	-	4	Asphaltic concrete	kei-50	6	Disintegrated granite	150	Subgrade (CL-SM)	100		
R9E	Secondary runway 12-30 end used as part of taxiway 1A	150	-	-	-	-	11	Portland cement concrete	kei-50	6	Dry bound macadam	80	Sandy silt (M)	4		
T1A	Taxiway 1, sta 1+50.74 to 4+006.24	3,895.5	50	-	-	-	25	Portland cement concrete	700	4	Compacted in-place material	150	Subgrade (CL-SM)	100	Excellent	
T2A	Taxiway 1, sta 4+006.24 to 50+06.24	1,000	75	-	-	-	24	Portland cement concrete	705	18	Disintegrated granite	200	Sandy clay (CL)	100	Excellent	

(1 of 3 sheets)

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Table 3 (Continued)  
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY NUMBER AND IDENTIFICATION	FACILITY	OVERLAY PAVEMENT				PAVEMENT				SUBGRADE				GENERAL CONDITION OF AREA CONSIDERED
		LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	FLEX. STR. PSI	THICK. IN.	DESCRIPTION	FLEX. STR. PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CBR OR K	
TSA	Taxiway 1, sta 5+06.20 to 61+06.24	1,150	50				25	Portland cement concrete	700	18	Disintegrated granite	150	Subgrade	Excellent
TSA	Taxiway 1, sta 61+06.20 to 70+06.11	1,168.8	Varies			23	Portland cement concrete	700	4	Compacted in-place material	150	Subgrade	Excellent	
TSA	Taxiway 5, sta .40 to 4+05	381	75			25	Portland cement	700	18	Disintegrated granite	150	Sandy clay (M.)	Excellent	
TSA	Taxiway 5, sta .405 to 10+00	675	75			23	Portland cement concrete	700	4	Compacted in-place material	150	Sandy clay (T.)	Excellent	
TSA	Outer ramp taxiway	6,025	150	13-16	Portland cement concrete	850	6	Portland cement concrete	650		Silty sand-sandy silt (SM-M)		Excellent	
TSA	Outer ramp taxiway	3,950	85	5	Asphaltic concrete ≤500									
TSA	Outer ramp taxiway extension	1,725	150			20	Portland cement concrete	850	6	Disintegrated granite	100	Silty sand-sandy silt (SM-M)	Excellent	
TSA	SAC alert taxiways	800	75			17	Portland cement concrete	650	6	Disintegrated granite	100	Subgrade (CL-M.)	Very good	
T1C	Taxiway 2, sta 1+16 to 3+11	195	Varies	13 to 7	Portland cement concrete $t_g = 17.7$	650	19	Portland cement concrete	755	30	Disintegrated granite	200	Clayey sand-silty sand (CL-M.)	Excellent
T1C	Taxiway 2, sta 3+11 to 4+11	150	75			26 to 20	Portland cement concrete	650	6	Disintegrated granite	100	Silty sand-sandy silt (SM-M)	Excellent	
T1C	Taxiway 2, sta 4+11 to 25+00	2,039	75			17-19	Portland cement concrete	650	6	Disintegrated granite	100	Silty sand-sandy silt (SM-M)	Excellent	
T1C	Taxiway 1A connecting outer ramp taxiway with taxiway 2	750	Varies			16-11-18	Portland cement concrete	650	6	Disintegrated granite	100	Silty sand-sandy silt (SM-M)	Excellent	
T1C	Taxiway 3	1,700	150			3	Asphaltic concrete	6						
T1C	Taxiway 4	2,000	150											
T1C	Hanger access taxiway	1,203	75			15	Portland cement concrete	670	12	Disintegrated granite	80	Fine gravel	4	Fair
A1B	Warming apron 1	Varies	Varies			17	Portland cement concrete	680	6	Disintegrated granite	100	Fine sand (SP)		
A2B	Warming apron 3	Varies	Varies			17	Portland cement concrete	680	6	Disintegrated granite	100	Silty sand-sandy silt (SM-M)		
A3B	No warming apron and parking system	Varies	Varies			11	Portland cement concrete	650	6	Disintegrated granite	150	Sandy silt (SM)		
A4B	Parking apron SE extension	Varies	Varies			17	Portland cement concrete	700	6	Disintegrated granite	100	Clayey sand-silty silt		Excellent
A5B	Parking apron SW extension	Varies	Varies			17	Portland cement concrete	680	6	Disintegrated granite	100	Subgrade (CL-M.)		Excellent

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Table 3 (Continued)  
SUMMARY OF PHYSICAL PROPERTY DATA

FACILITY NUMBER AND IDENTIFICATION	OVERLAY PAVEMENT			PAVEMENT			BASE			SUBGRADE	
	LENGTH FT	WIDTH FT	THICK. IN.	DESCRIPTION	THICK. IN.	DESCRIPTION	FLEX STR PSI	THICK. IN.	CLASSIFICATION	CBR OR K	CLASSIFICATION
A6B Parking apron eastern half	Varies	Varies			11	Portland cement concrete	720	6	Disintegrated granite	150	Clayey sand-silty silt (CL-ME)
A7B Parking apron refueling areas	Varies	Varies			11	Portland cement concrete	650	6	Disintegrated granite	100	Clayey sand-silty silt (CL-ME)
A8B Parking apron strengthening	2,575	85			11	Portland cement concrete	700	6	Disintegrated granite	100	Clayey sand-silty silt (CL-ME)
A9B Parking apron formerly part of runway 3	450	150			10	Portland cement concrete	650	6	Disintegrated granite	100	Clayey sand-silty silt (CL-ME)
A10B Transient apron	8	1,440			4	Asphaltic concrete	7	7	Dry bound macadam	80	Sand-silt (CL-ME)
A11B Parking apron formerly taxiway 1A	2,200	75					6	6	Gravelly sand	65	
Parking apron formerly taxiway 2							6	6	Disintegrated granite	20	
							6	6	Compacted subgrade	8	
A12B SAC alert apron	2,100	270			11	Portland cement concrete	650	6	Disintegrated granite	150	Sandy silt (ME)
A13B Hangar aprons	372	238			21	Portland cement concrete	765	30	Disintegrated granite	200	Sandy clay (CL)
A14C Flat pads ends	150	300			15	Portland cement concrete	650	12	Disintegrated granite	100	Sandy clay (CL)
B15X Overruns ends	850	300			2	Bituminous surface course	6	6	Silt, aggregate BC		Good
							2	2	Flexible pavement		
							6	6	Stab. aggregate BC		
							6-1/2	6	Flexible subbase BC		
							6	6	Select borrow		

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DATE: December 1972

## SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

APPENDIX  
MATERIALS/TESTS, Quality.

FEATURE NO.	DESIGNATION	Slab size ft	Thickness in.	No. of Slabs	NO. OF SLABS CONTAINING INDICATED DEFECTS												% of Slabs No defects	% of Slabs No major defects	% of Slabs No condition defects		
					I	—	\	*	K	~~	S	J	†	M	P	O	C	D			
R1A	NW-SE runway; 1st 500 ft, 13 end	25 by 25 75 by 25	90	13	1						5					1			92.2	98.8	Excellent
R2B	NW-SE runway; 2nd 500 ft, 13 end	25 by 25 75 by 25	71	13							2	2							94.3	100.0	Excellent
R3C	NW-SE runway interior	25 by 25 75 by 25	1,311	13	2						16	5	15			22			95.8	99.8	Excellent
R4C																					
R6B	NW-SE runway; 2nd 500 ft, 31 end	25 by 25	160	13													1		99.4	100.0	Excellent
R7A	NW-SE runway; 1st 500 ft, 31 end	25 by 25	160	14	1						1	1							98.1	99.4	Excellent
R8E	Secondary runway 12-1/2 as taxiway	12-1/2 by 15	180	11	1										20			88.7	99.4	Excellent	
T1A	Taxiway 1	25 by 25	1,005	23 to 25							1	3	2			1			99.3	100.0	Excellent
T2A																					
T3A																					
T4A																					
T5A	Taxiway 5	25 by 25	153	23, 25													1		99.3	100.0	Excellent
T6A																					
T7A	Outer ramp taxiway	25 by 25	1,644	13-16	1	2	1				12	3	14			17	24		95.1	99.8	Excellent
T8A	Outer ramp taxiway	12-1/2	8,857	20	5	26	14	30	1	27	25	42	113	13	22			96.4	99.1	Excellent	
A7B	Parking apron re- surfacing areas	by 15	11																		
REMARKS:																					

LEGEND:

	Longitudinal crack
—	Transverse crack
\	Diagonal crack
△	Corner break
*	Shattered slab
K	Keyed joint failure
~~	Shrinkage crack
S	Scaling
J	Spall on transverse joint
†	Spall on longitudinal joint
P	Pop-out
O	Uncontrolled contraction crack
C	Corner spall
D	"D" cracking
◆	Settlement

WES FORM NO. 2004  
JUN 1972

(1 of 3 sheets)

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Table 4 (Continued)

## SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

DATE: December 1972

FEATURE	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	NO. OF SLABS CONTAINING INDICATED DEFECTS																
					-	\	*	K	~	S	J	†	M	P	O	C	D			
TIA Outer ramp taxi-way extension	25 by 25	414	17	17	1					14		1	14			92.8	95.8			
TIOA SAC alert apron taxiways	25 by 25	465	21							1						95.7	100.0			
TIC Taxiway 2	25 by 25	396	13.7	6	1					2	1	1	6			18				
TICC T12C			26-30														91.7	98.5		
T13C			17-19															Excellent		
T14C	Taxiway IA connecting ramp with taxiway 2	12-1/2 by 12-1/2	403	18-21-18	2	9			1		1	1	76	3	77.9	97.5	Very good			
T17B	Hanger access taxiway	25 by 25	57	15	1										1	96.4	95.2	Excellent		
A1B	Warm-up apron 1	25 by 25	268	17													97.7	100.0	Excellent	
A2B	Warm-up apron 3	25 by 25	319	17													96.8	100.0	Excellent	
A3B	NW warm-up apron and parking apron by 15	12-1/2 by 15	887	11	1					3		1	1	4			98.0	99.6	Excellent	
A4B	Parking apron A1B SE extension	25 by 25	1,365*	17	15	1	1										90.9	99.3	Excellent	
A5B	Parking apron NW extension	25 by 25	1,102	17												2	1	97.7	99.3	Excellent

REMARKS: \* Slabs not surveyed because of parked aircraft.

LEGEND:		LONGITUDINAL CRACK	M	MAP CRACKING
	-	TRANSVERSE CRACK	P	PUMPING JOINT
	\	DIAGONAL CRACK	O	POP-OUT
	△	CORNER BREAK	C	UNCONTROLLED CRACK
	*	SHATTERED SLAB	D	CONTRACTION CRACK
	K	KEYED JOINT FAILURE		"D" CRACKING
				SETTLEMENT
				◆

SHRINKAGE CRACK	M	MAP CRACKING
SCALING	P	PUMPING JOINT
SJ	O	POP-OUT
SPALL ON TRANSVERSE JOINT	C	UNCONTROLLED CRACK
↓		CORNER SPALL
SPALL ON LONGITUDINAL JOINT		CONTRACTION CRACK
CORNER SPALL		"D" CRACKING
SHATTERED SLAB		SETTLEMENT
KEYED JOINT FAILURE		◆

WES FORM NO. 2004  
JUN 1972

(2 of 3 sheets)

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Table 4 (Continued)

DATE: December 1972

## SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY

SUMMARY OF DATA - RIGID PAVEMENT CONDITION SURVEY												NO. OF SLABS CONTAINING INDICATED DEFECTS												
FEATURE	SLAB SIZE FT	APPROX NO. OF SLABS	PAVE. THICK. IN.	1	-	\	*	K	~~	S	T	Y	J	◆	M	P	O	C	D					
ACB	12-1/2 by 15	16,010	11	9	2	15	6			23	21	67	243		20		14							
Parking apron																								
ACB	12-1/2 by 15	832	11	15							6	9	5					5	1		95.3	98.1	Excellent	
Parking apron strengthening																								
ACB	12-1/2 by 15	289	10	5							5							15			98.9	98.2	Very Good	
Parking apron formerly part of runway 3																								
ACB	12-1/2 by 15	1,095	8	33	13	13	6	3	38		9	72			2	4	6			85.9	95.7	Very Good		
SAC alert apron																								
ACB	12-1/2 by 25	21																						
ACB	25 by 25	279	15																					
ACB	25 by 25	279	15																					
ACB	25 by 25	279	15																					
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WES FORM NO. 2004  
JUN 1972

(3 of 3 sheets)

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Table 5  
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: March AFB, Calif.		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS									
DATE OF EVALUATION MONTH: December YR: 1972		TRICYCLE ARRANGEMENT									
FEATURE NO.	DESIGNATION	PAVEMENT OPERATIONAL USE	SINGLE 100-PSI TIRE PRESSURE	SINGLE 100-PSI, CONTACT AREA	SINGLE 241-SQ-IN. CONTACT AREA	SINGLE 286-SQ-IN. CONTACT AREA	TW 28-IN. C-C 286-SQ-IN. CONTACT AREA EACH TIRE	TW 44-IN. C-C 630-SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 83-IN. X 40-IN. 208-SQ-IN. CONTACT AREA EACH TIRE	BICYCLE	
R1A	RW-SE runway 1st 500 ft. 13 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	225,000	7	8	9
R2B	RW-SE runway 2nd 500 ft. 13 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	270,000	330,000+	380,000+	380,000
R3C	RW-SE runway interior	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	510,000
R4B	RW-SE runway 2nd 500 ft. 31 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	550,000
R7A	RW-SE runway 1st 500 ft. 31 end	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	540,000
T1A	Taxiway 1	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	560,000
T2A	Taxiway 1 replacement	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	600,000
T3A	Taxiway 1	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	490,000
T7A	Outer ramp taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	310,000	330,000+	800,000+	490,000
T8A	Outer ramp taxiway	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	310,000	330,000+	800,000+	440,000
T9A	Outer ramp taxiway extension	Capacity	155,000+	85,000+	155,000+	210,000	200,000+	290,000	330,000	800,000+	290,000
T10A	SAC alert taxiways	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	330,000+	800,000+	520,000

Note: + sign denotes allowable gross loading greater than maximum gross weight of any existing aircraft having indicated gear configuration.

(a) denotes allowable gross landing less than minimum gross weight of any existing aircraft having indicated gear configuration.

(1 of 3 sheets)

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Table 5 (Continued)  
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: March AFB, Calif.		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS									
DATE OF EVALUATION MONTH: December YR: 1972		TRICYCLE ARRANGEMENT									
FEATURE	PAVEMENT OPERATIONAL USE	SINGLE 100-PSI TIRE PRESSURE	SINGLE 100-PSI CONTACT AREA	SINGLE 241 SQ-IN. CONTACT AREA	TW 28 IN. C/C AD-IN SPACING 400 SQ-IN. CONTACT AREA EACH TIRE	TW 31 IN. C/C AD-IN SPACING 400 SQ-IN. CONTACT AREA EACH TIRE	TW 44 IN. C/C 267 SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 31 IN. x 44 IN. 208 SQ-IN. CONTACT AREA EACH TIRE	TWIN TANDEM 31 IN. x 44 IN. 208 SQ-IN. CONTACT AREA EACH TIRE	BICYCLE	
NO.	DESIGNATION	1	2	3	4	5	6	7	8	9	10
T11C	Taxiway 2 sta 1+15 to 3+11	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	215,000	270,000	350,000	800,000+
T12C	Taxiway 2 sta 3+11 to 4+61	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	255,000	320,000	380,000+	800,000+
T13C	Taxiway 2 sta 4+61 to 25+00	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	235,000	300,000	380,000+	800,000+
T15C	Taxiway 3	Capacity	65,000	50,000	(a)	(a)	100,000	85,000	(a)	(a)	(a)
T16C	Taxiway 4	Capacity	125,000	85,000+	155,000+	175,000	200,000	195,000	240,000	330,000	800,000+
T17B	Hangar access taxiway and hangar aprons	Capacity	125,000	85,000+	155,000+	175,000	200,000	195,000	240,000	330,000	800,000+
A1B	Warm-up apron 1	Capacity	155,000+	85,000+	155,000+	215,000	200,000+	235,000	295,000	380,000+	800,000+
A2B	Warm-up apron 3	Capacity	75,000	60,000	105,000	110,000	170,000	125,000	165,000	235,000	680,000 (a)
A5B	Parking apron	Capacity	155,000+	85,000+	155,000+	215,000	200,000+	235,000	295,000	380,000+	800,000+
A3B	NW warm-up apron	Capacity	75,000	60,000	105,000	110,000	170,000	125,000	165,000	235,000	680,000 (a)
A11B	Parking apron	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	245,000	300,000	380,000+	800,000+
A4B	Parking apron SE extension	Capacity	155,000+	85,000+	155,000+	220,000	200,000+	245,000	300,000	380,000+	800,000+
A6B	Parking apron eastern half	Capacity	85,000	65,000	120,000	125,000	190,000	140,000	185,000	265,000	760,000 (a)
A7B	Parking apron refueling areas	Capacity	75,000	60,000	100,000	105,000	165,000	120,000	155,000	220,000	640,000 (a)
A8B	Parking apron strengthening	Capacity	80,000	65,000	110,000	115,000	175,000	130,000	165,000	235,000	690,000 (a)
A9B	Parking apron formerly part of runway 3	Capacity	70,000	60,000	100,000	105,000	160,000	120,000	155,000	220,000	630,000 (a)

(2 of 3 sheets)

Table 5 (Continued)  
SUMMARY OF PAVEMENT EVALUATION

NAME OF AIRFIELD: March AFB, Calif. <sup>2</sup> .		LOAD-CARRYING CAPACITY IN LB OF GROSS PLANE LOAD FOR INDICATED LANDING GEAR TYPES AND CONFIGURATIONS									
DATE OF EVALUATION MONTH: December YR: 1972		TRICYCLE ARRANGEMENT									
FEATURE	PAVEMENT OPERATIONAL USE	SINGLE TIRE PRESSURE 100-SIIN	SINGLE 100-SIIN CONTACT AREA	SINGLE 24-SIIN CONTACT AREA	TW 26-IN C-C 220-SQ-IN CONTACT AREA EACH TIRE	SINGLE TANDEM 60-IN SPACING 400-SQ-IN CONTACT AREA EACH TIRE	TW 37-IN C-C 267-SQ-IN CONTACT AREA EACH TIRE	TW 44-IN C-C 690-SQ-IN CONTACT AREA EACH TIRE	TWIN TANDEM 31-IN x 46-IN 320-SQ-IN CONTACT AREA EACH TIRE	BICYCLE	
NO.	DESIGNATION	1	2	3	4	5	6	7	8	9	REMARKS
A10B	Transient apron	70,000	60,000	65,000	85,000	105,000	65,000	(a)	340,000	(a)	SPG 37-4-27 ADS 50-in CONTACT AREA EACH TIME
A12B	SAC alert apron	Capacity	155,000+	85,000+	155,000+	220,000+	200,000+	330,000+	380,000+	800,000+	550,000

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JUNE 1972

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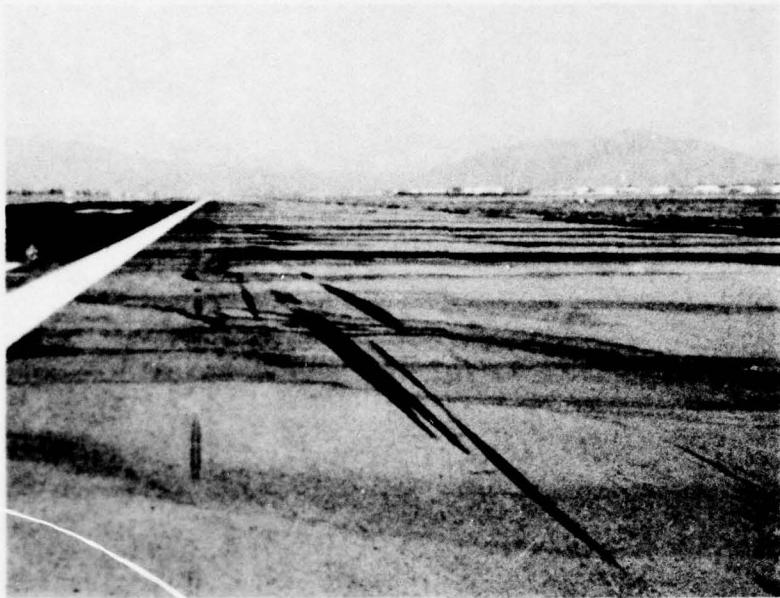


Photo 1. AC portion of NW-SE runway near SE end

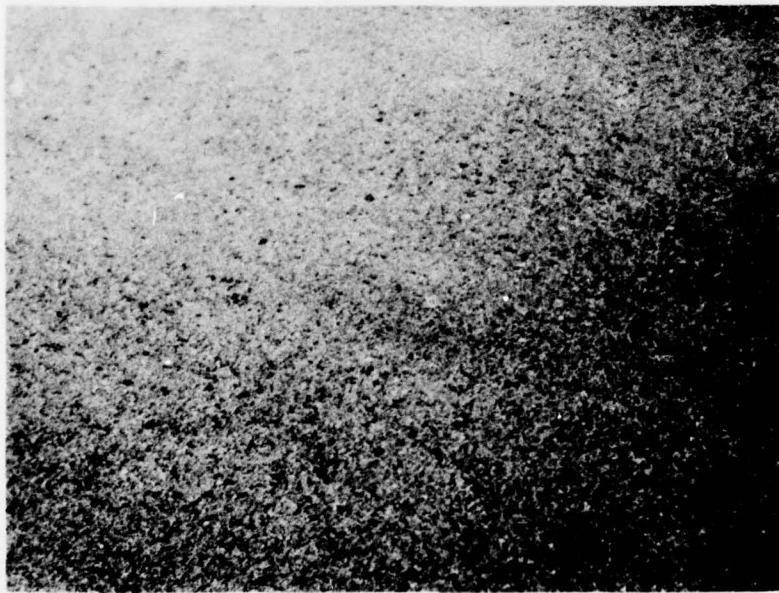


Photo 2. Close-up of AC portion of NW-SE runway near SE end

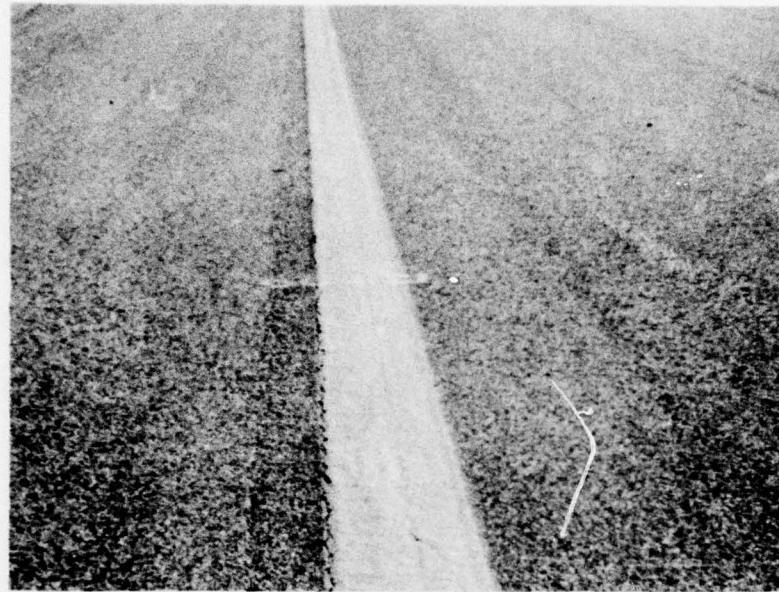


Photo 3. Typical condition of taxiway 3



Photo 4. Typical condition of taxiway 4

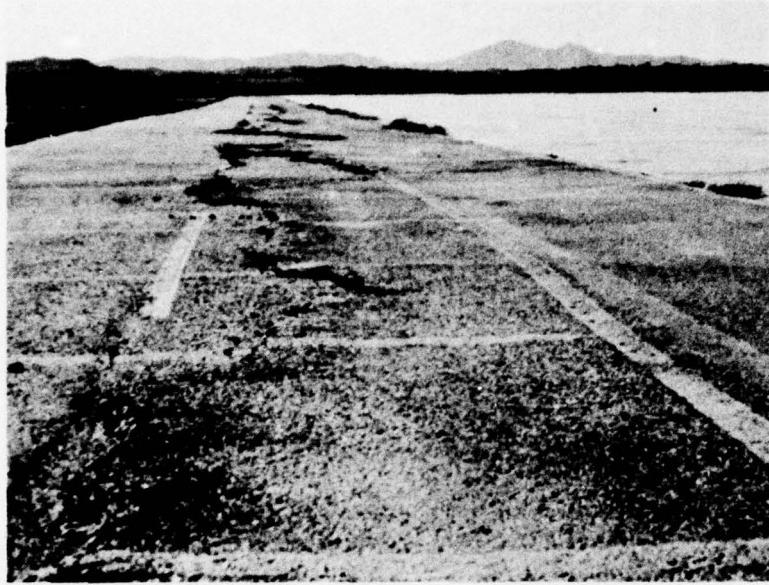


Photo 5. Shoving of shoulder pavement along south end  
of parking apron



Photo 6. Shoving of shoulder pavement along east side  
of parking apron near south end



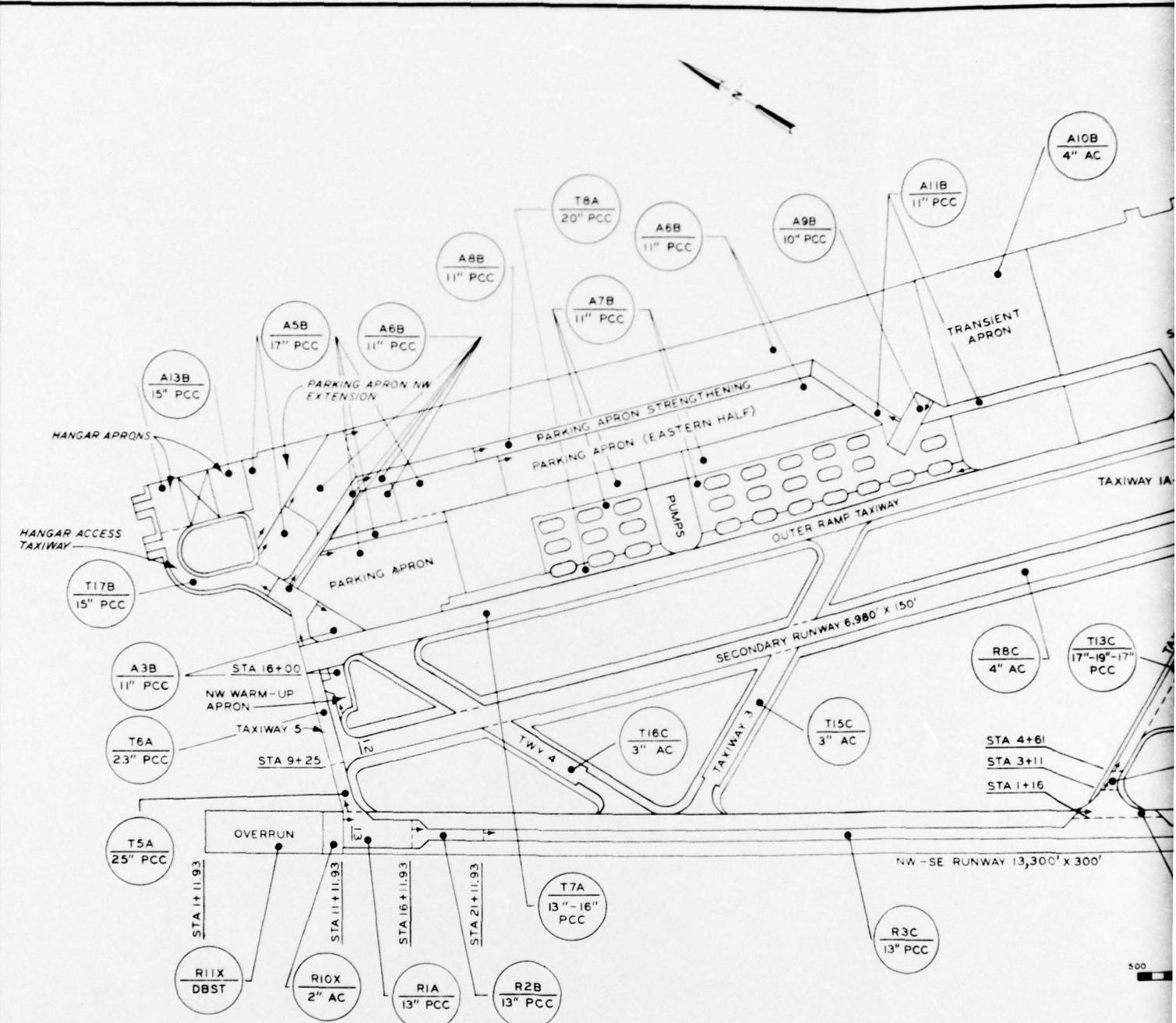
Photo 7. Upheaval of shoulder pavement along east side  
of parking apron near south end



Photo 8. Typical cracks in AC pavement of refueling  
portion of parking apron



Photo 9. Typical poor condition of AC of transient apron



NOTES: 1. FEATURE DESIGNATION DENOTES TYPE OF FEATURE,  
NUMBER OF FEATURE FOR GIVEN TYPE, AND  
TYPE TRAFFIC AREA.  
2. TRAFFIC AREA DESIGNATIONS ARE BASED ON  
HEAVY-LOAD CRITERIA.

LEGEND



TYPE OF FEATURE

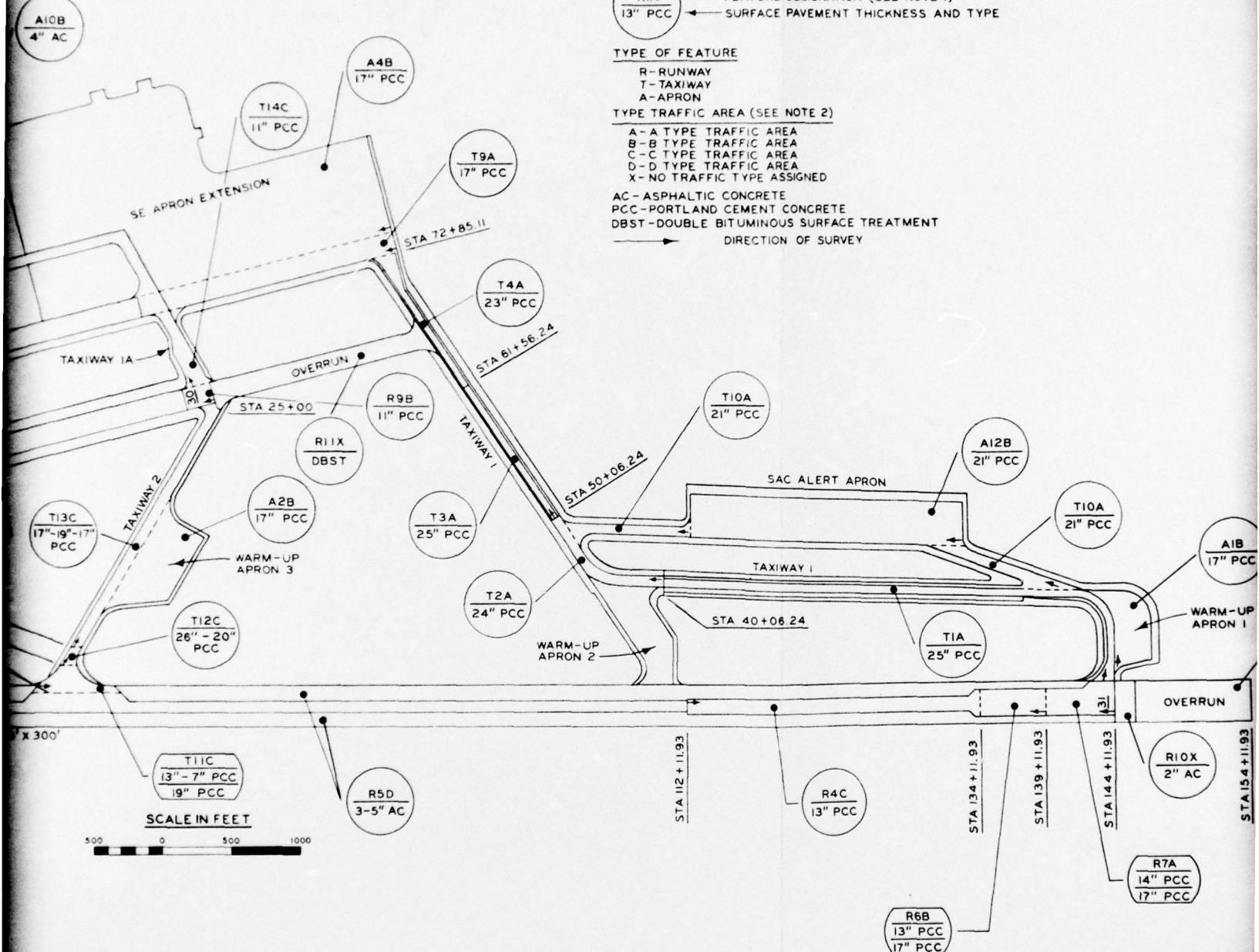
R - RUNWAY  
T - TAXIWAY  
A - APRON

TYPE TRAFFIC AREA (SEE NOTE 2)

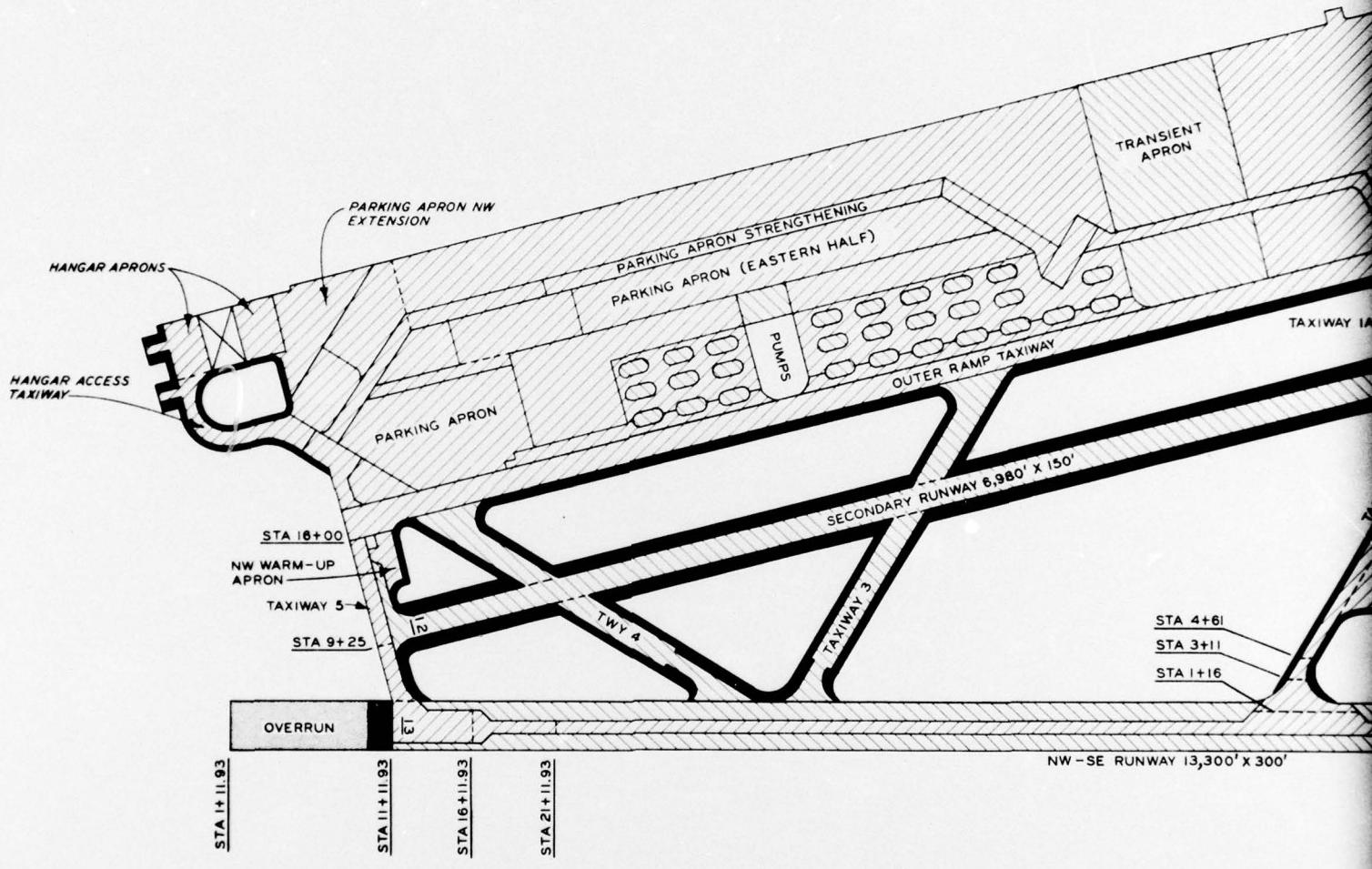
A - A TYPE TRAFFIC AREA  
B - B TYPE TRAFFIC AREA  
C - C TYPE TRAFFIC AREA  
D - D TYPE TRAFFIC AREA  
X - NO TRAFFIC TYPE ASSIGNED

AC - ASPHALTIC CONCRETE  
PCC - PORTLAND CEMENT CONCRETE  
DBST - DOUBLE BITUMINOUS SURFACE TREATMENT

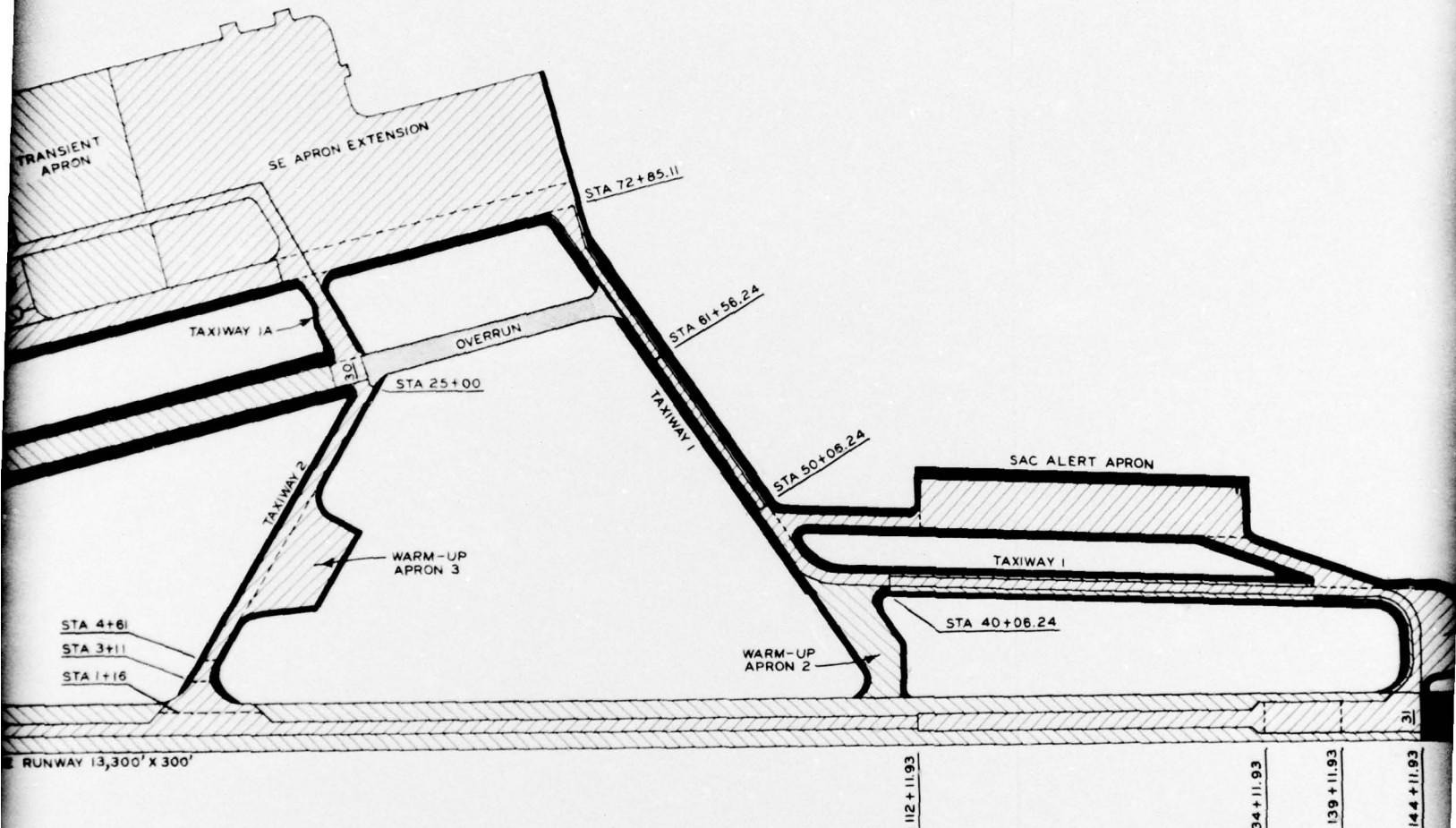
DIRECTION OF SURVEY →



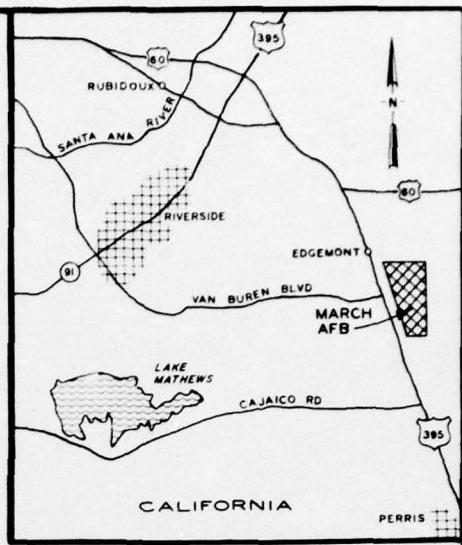




LEGEND	
	PORLTAND CEMENT CONCRETE (PCC)
	ASPHALTIC CONCRETE (AC)
	DOUBLE BITUMINOUS SURFACE TREATMENT (DBST)
	BLAST PAVEMENT (AC - NON TRAFFIC)



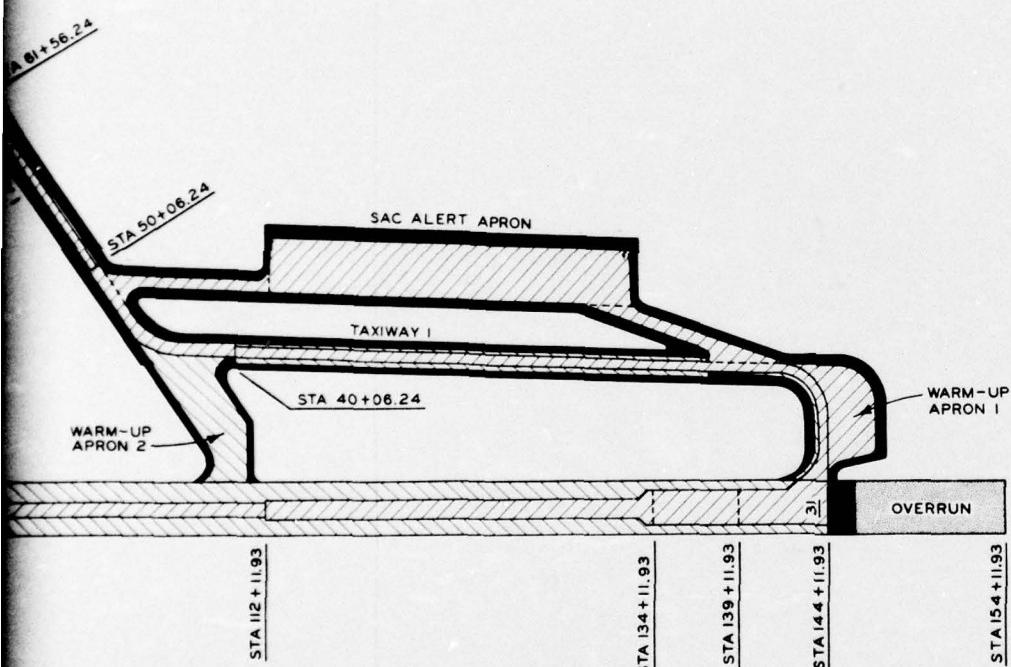
MENT (DBST)



VICINITY MAP

SCALE IN MILES

2 0 2 4 6



MARCH AFB  
PAVEMENT PLAN

PLATE 2

3